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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/528,369

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Hidetoshi Saitoh

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06/25/2008

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EXAMINER

SNYDER, ZACHARY J

ART UNIT

PAPER NUMBER

4135

MAIL DATE

DELIVERY MODE

06/25/2008

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/528,369	Applicant(s) SAITOH ET AL.	
	Examiner Zachary Snyder	Art Unit 4135	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 07 January 2008.
- 2a) ☐ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-8 and 11-16 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-8 and 11-16 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on N/A is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Examiner's Comments

This second non-final rejection is being issued because the examiner mistakenly examined the wrong amended claims. A first non-final action was mailed on April 30, 2008 on the merits of the non-most recent amended claims and is now superseded by this second non-final rejection.

Drawings

The subject matter of this application admits of illustration by a drawing to facilitate understanding of the invention. Applicant is required to furnish a drawing under 37 CFR 1.81(c). No new matter may be introduced in the required drawing. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d).

The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they do not include any of the reference signs mentioned in the description.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will

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be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Objections

Claim 12 is objected to because of the following informalities:

“disposed opposite to each other in the container” lacks antecedent basis. This should be changed to “disposed opposite to each other in a container”

Appropriate correction is required.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-8 and 11-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP 2001-357771 to Koji et al. and further in view of JP 2001-114600 to Hidetoshi et al.

In regard to claim 1, Koji discloses in figure 5 a light emitting device (luminescent device 5000, paragraph 41-43), wherein a light emitting electrode (electron emission element 500) and a cold cathode (cold cathode 505) are disposed opposite to each other,

wherein the light emitting electrode and the cold cathode are respectively constituted by a metal oxide structure having whiskers (acicular particle 504) of a metal oxide (Zinc oxide, paragraph 43) grown on a surface of a substrate (glass substrate 501) by vapor phase growth and not that the light emitting electrode and the cold cathode are respectively constituted by a metal oxide structure having whiskers of a metal oxide grown on a surface of a substrate by CVD.

Hidetoshi discloses a light emission element made from a metal oxide structure having whiskers (metallic oxide structure which consists of two or more metallic-oxide micro crystallites, paragraph 1). Hidetoshi discloses that the method of obtaining this metallic oxide structure is a metalorganic chemical vapor deposition (MOCVD, paragraph 2).

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to construct the metal oxide structures use in Koji's invention using CVD instead of VPG because it is a well known alternative in the art for forming metallic oxide structures having whiskers.

In regard to claim 2, Koji in view of Hidetoshi teaches all the limitations of claim 1. The applicant claims that the band gap of the metal oxide constituting the whiskers is from 1.5 to 7.7 eV. 1.5eV to 7.7eV is equivalent to the wavelengths ranging from 826.67 nm to 161.03nm. Koji's invention discloses that the embodiment has a monochrome picture (paragraph 58). A

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monochrome picture implies that this is within the visible spectrum. The visible spectrum is arguably between 750 nm and 380nm and well within the claimed ranges.

In regard to claim 3, Koji in view of Hidetoshi teaches all the limitations of claims 1 and 2. Koji also discloses in that the diameter of a cross-section of an approximate circle of the whisker is from 0.01 to 100 micrometers (ZnO whisker has a diameter between 0.1 and 10 micrometers, paragraph 43) and a ratio of length of the whisker to the diameter of the cross-section of the approximate circle of the whisker is from 1 to 10000 (length of one whisker is 1-200 micrometers and therefore the ratio is within range, paragraph 22).

In regard to claim 4, Koji in view of Hidetoshi teaches all the limitations of claim 1. Koji also discloses that the whiskers are present in a density of from 0.1 to 10000 pieces per area of 10 micrometers by 10 micrometers on a surface of the metal oxide because Koji has stated that the diameter of the whiskers is between 0.1 and 10 micrometers and therefore can have density between 10 and 1000 whiskers per 10 micrometer by 10 micrometer area (ZnO whisker has a diameter between 0.1 and 10 micrometers, paragraph 43).

In regard to claim 5, Koji in view of Hidetoshi teaches all the limitations of claim 1. Koji also discloses that the whiskers (acicular particle 504) comprise an element (oxygen) different from that of a main material (zinc) which constitutes the whiskers (acicular particle 504 is made of Zinc oxide, paragraph 43).

In regard to claim 6, Koji in view of Hidetoshi teaches all the limitations of claim 1. Koji also discloses that the whiskers (acicular particle 504) can be obtained by allowing the metal oxide (zinc oxide, paragraph 42) to be epitaxially grown on a surface of a substrate (acicular particle 504 is grown on the glass substrate 501 by vapor phase growth with is a epitaxial growth method).

In regard to claim 7, Koji in view of Hidetoshi teaches all the limitations of claim 1. Koji also discloses that zinc oxide is used as the main material which constitutes the whiskers (acicular particle 504 is made of Zinc oxide, paragraph 43).

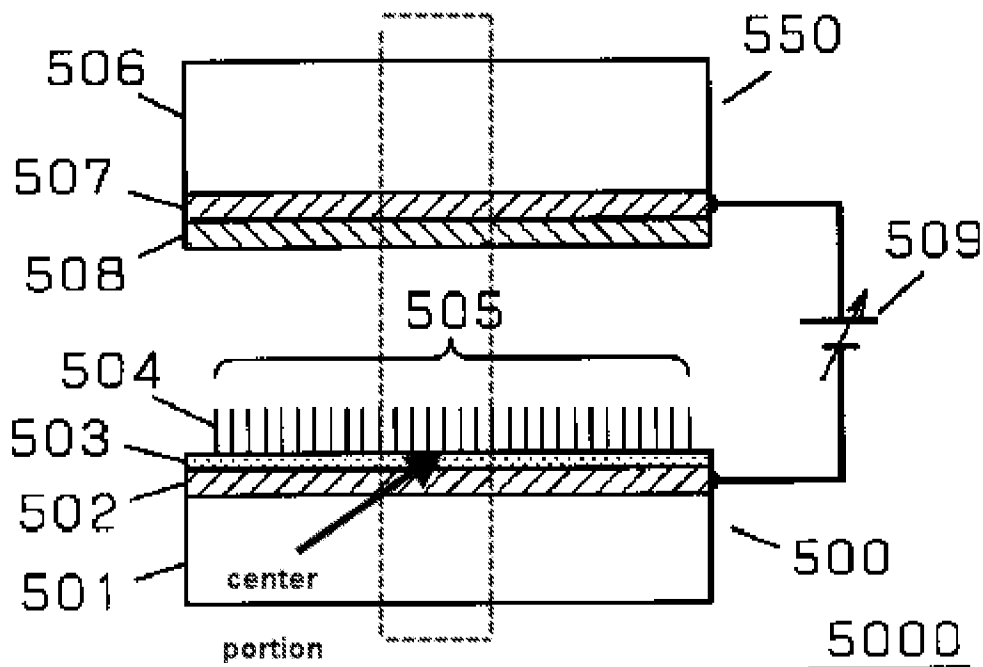
In regard to claim 8, Koji in view of Hidetoshi teaches all the limitations of claim 1. Koji also discloses that the light emitting electrode is constituted by the metal oxide structure (acicular particle 504 is made of zinc oxide, paragraph 43) in which spaces between whiskers are filled with a metal (foundation layer 503 is made of Al_2O_3 , paragraph 43, shown in figure 5).

In regard to claim 11, Koji in view of Hidetoshi teaches all the limitations of claim 1. Koji also discloses that the light emitting electrode (electron emission element 500, paragraph 43) and the cold cathode (cold cathode 505, paragraph 43) are disposed in a vacuum chamber (The space between the electron emission elements 500 and the anode substrates 550 of figure 5 is a vacuum, paragraph 45).

In regard claim 12, Koji in view of Hidetoshi teaches all the limitations of claim 1. Koji also discloses that the light emitting electrode (electron emission element 500) in a planar shape (shown in figure 5) and the cold cathode (cold cathode 505) in a planar shape (shown in figure 5) are disposed opposite to each other in a container (shown in figure 5, both are inherently held in a container and opposite one another).

In regard to claim 13, Koji in view of Hidetoshi teaches all the limitations of claim 12. Koji also discloses in figure 7 that a reflecting plate (fluorescent substance 710 has a reflecting layer laminated on it, paragraph 58) is provided on one side face of a space defined by the light emitting electrode (electron emission element 700, paragraph 56) and the cold cathode (cold cathode 707, paragraph 58).

In regard to claim 14, Koji in view Hidetoshi teaches all the limitations of claim 11. Koji also discloses that the light emitting electrode (electron emission element 500) is disposed on an inner surface of the container (inherently held in a container) and the cold cathode (cold cathode 505) is disposed in a center portion of the container (shown below).



In regard to claim 15, Koji in view of Hidetoshi teaches all the limitations of claim 12. Koji also discloses that an electron accelerating electrode (conductive electrode 502 is connected to DC power supply 509 which accelerates electrons, paragraph 22) is provided between the cold cathode (cold cathode 505) and the light emitting electrode (electron emission element 500).

In regard to claim 16, Koji in view of Hidetoshi teaches all the limitations of claim 1. Hidetoshi also discloses that the radiation emitted by the prior art can be ultra violet (paragraph 36).

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to have the light emitting device as disclose by Koji emit light in the ultraviolet region as taught by Hidetoshi for use with the embodiment of figure 7 of Koji that uses a fluorescent

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substance layer as it is well known in the art for the purpose of constructing a light emission element utilizing whisker emitters.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Zachary Snyder whose telephone number is (571)270-5291. The examiner can normally be reached on Monday through Thursday, 7:30AM to 6PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, William M. Brewster can be reached on (574)272-1854. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Zachary Snyder/

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/Z. S./

Examiner, Art Unit 4135

/Jessica T Stultz/

Primary Examiner, Art Unit 4135